PERIODIC TRENDS TEST -- REVIEW

a) O b) Mg c) Se d) Na e) Rb ab) F

Match the above elements with the descriptions below.

1) Metal with the largest radius

2) Metal with the smallest radius

3) Non-metal with the largest radius

4) Non-metal with the smallest radius

5) Most metallic element

6) Least metallic element

7) Most reactive metal

8) Least reactive metal

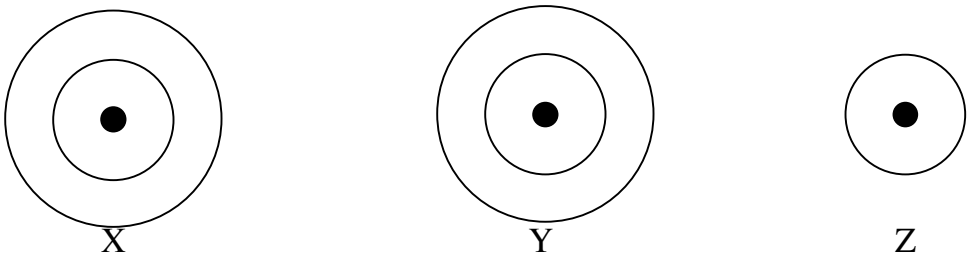
9) Most reactive non-metal

10) Least reactive non-metal

11) Element with highest ionization energy

12) Element with lowest ionization energy

Use the following diagrams to answer questions 13-18



13) Which of the atoms has the lowest electronegativity?
a) X b) Y c) Z

14) Which of the atoms would have the largest radius? (Note: as discussed in class, even though X and Y are drawn with the same radius, they actually do not have the same radius)
a) X b) Y c) Z

15) From which of the 3 atoms is it easiest to remove an outer electron?
a) X b) Y c) Z

16) Which of the atoms would form an ion with a -2 charge?
a) X b) Y c) Z

17) Which of the three atoms has the highest ionization energy?
a) X b) Y c) Z

18) Identify atoms X, Y, and Z. Write the symbol next to each picture.
a) O, Be, He b) F, Be, He c) O, Li, He d) F, Li, He

19) Atomic radius for an element is often reported as bond radius. Bond radius is…
a) the distance between the nuclei of 2 adjacent atoms
b) half the distance between the nuclei of 2 adjacent atoms
c) the distance across an entire atom

20) The element with the smallest atomic radius is _____, while the element with the largest atomic radius is _____.
a) Fr / He b) F / Fr c) Fr / F d) He / Fr

21) The element with the lowest ionization energy is ___, while the element with the highest ionization energy is ___.
a) Fr / He b) F / Fr c) Fr / F d) He / Fr

22) Atoms with a very small radius tend to have _____, while atoms with a very large radius tend to have _____.
a) high ionization energies / low ionization energies
b) low ionization energies / high ionization energies
c) low ionization energies / low ionization energies
d) high ionization energies / high ionization energies

23) Rank the following elements in order of increasing atomic radius: Se, Ga, O, Cs, Rb
a) Se, Ga, O, Cs, Rb b) Cs, Rb, Ga, Se, O c) O, Se, Ga, Rb, Cs d) O, Se, Rb, Ga, Cs

24) A non-metal which is very active tends to…
a) have low ionization energy b) have high ionization energy c) lose electrons quite easily
d) take electrons quite well e) both b & d

25) Shielding in atoms increases as…
a) the number of occupied energy levels decreases
b) the number of occupied energy levels increases

26) Which electron would require the least energy to remove from an atom of sodium (Na)?
a) an electron in the 1s sublevel
b) an electron in the 2s sublevel
c) an electron in the 3s sublevel
d) there is no difference – all electrons require the same amount of energy for removal

27) The metals in Group 2 are called the…
a) alkali metals b) alkaline earth metals c) transition metals d) halogens e) noble gases

28) The non-metals in Group 17 are called the…
a) alkali metals b) alkaline earth metals c) transition metals d) halogens e) noble gases

29) The elements in groups 3-12 are called the…
a) alkali metals b) alkaline earth metals c) transition metals d) halogens e) noble gases

30) An unidentified metallic element is very soft. It reacts violently in water and its electron configuration ends in $6s^1$. Identify the element.
a) Na b) K c) Rb d) Ba e) Cs

31) In a bond between two elements, which element more effectively attracts the shared electrons?
a) the element with higher electronegativity
b) the element with lower electronegativity

32) The noble gases fit the trend for _____ because it is difficult to remove an electron from them.
a) ionization energy b) electronegativity c) ionic radius

MATCHING: 33-41 (NOTE: You need to mark more than one letter for the final four lettered choices)

33) _____electronegativity	A. a row on the periodic table
34) _____ionization energy	B. one half the distance between nuclei in a diatomic element
35) _____period	C. the radius of an atom ***after*** it has gained or lost electron(s)
36) _____group	D. an atom's inner electrons _____ the outer electrons from the pull of the positively charged nucleus.
37) _____atomic radius	E. tendency of an atom to attract electrons to itself in a chemical bond
38) _____ionic radius	AB. the energy you use to remove an electron from an atom
39) _____shield	AC. a column on the periodic table
40) _____valence electrons	AD. the name given to an atom's outermost electrons
41) _____isoelectronic	AE. ions or atoms which have the same electron configuration are _____

42) In nature metallic elements tend to _____ electrons, due to their _____ ionization energy values.
a) gain / low b) gain / high c) lose / low d) lose / high

43) Anions have a _____radius than their parent atoms, while cations have a _____radius than their parent atoms.
a) smaller / larger b) larger / smaller c) smaller / smaller d) larger/ larger

44) What is the electron configuration ($1s^2$ $2s^2$ etc.) for Li?
a) $1s^2\ 2s^2\ 2p^2$ b) $1s^2\ 2s^1$ c) $1s^2\ 2s^2\ 2p^6$ d) $1s^2\ 2s^2\ 2p^6\ 3s^2$ e) $1s^2\ 2s^2\ 2p^6\ 3s^1$

45) What is the electron configuration ($1s^2$ $2s^2$ etc.) for H?
a) $1s^2\ 2s^2\ 2p^2$ b) $1s^2\ 2s^2$ c) $1s^2\ 2s^2\ 2p^5$ d) $1s^2\ 2s^2\ 2p^6\ 3s^2$ e) $1s^1$

46) Which of these two atoms has a larger atomic radius? Li or H?
a) Li b) H c) they have the same radius

47) What is the electron configuration of Li^{+1}?
a) $1s^2\ 2s^1$ b) $1s^2\ 2s^2$ c) $1s^2$ d) $1s^2\ 2s^2\ 2p^1$ e) $1s^2\ 2s^2\ 2p^6$

48) What is the electron configuration of H^{-1}?
a) $1s^2\ 2s^1$ b) $1s^2\ 2s^2$ c) $1s^2$ d) $1s^2\ 2s^2\ 2p^1$ e) $1s^2\ 2s^2\ 2p^6$

49) Which of these two ions has a larger ionic radius? Li^{+1} or H^{-1} ?
a) Li^{+1} b) H^{-1} c) they have the same radius

50) Which of the following would have the smallest radius?
a) S^{2-} b) Cl^{-1} c) Ar d) K^+ e) Ca^{2+}

51) In an isoelectronic series of ions, which ion has the largest radius?
a) the ion with the greatest number of protons
b) the ion with the least number of protons
c) the ion with the greatest number of neutrons
d) the ion with the least number of neutrons

52) An unknown element conducts electricity. It is malleable and lustrous. It is most likely which of the following?
a) a non-metal b) a metalloid c) a metal

53) An unknown element does not conduct electricity. It is not malleable or lustrous. It is most likely which of the following?
a) a non-metal b) a metalloid c) a metal

54) An unknown element conducts electricity. It is not malleable, but it is lustrous. It is most likely which of the following?
a) a non-metal b) a metalloid c) a metal

MATCHING: 55-59 Match the element to the appropriate number of valence electrons

55) B a) 8

56) Sr b) 6

57) S c) 3

58) Xe d) 2

59) Rb e) 1

MATCHING: 60-64 Match the element to the appropriate charge it would possess as an ion

60) B — a) does not form ions readily

61) Sr — b) -2

62) S — c) +3

63) Xe — d) +2

64) Rb — e) +1

65) Which of the following has the largest radius?
a. Rb b. Sr c. Sn d. I

66) Which of the following is most nonmetallic (i.e. least metallic)?
a. Rb b. Sr c. Sn d. I

67) Which of the following has two valence electrons?
a. Rb b. Sr c. Sn d. I

68) Which of the following is **most** likely to lose an electron?
a. Rb b. Sr c. Sn d. I

69) Which of the following atoms would gain one electron in order to have 8 electrons in its outer shell?
a. Rb b. Sr c. Sn d. I

70) Which of the following is an alkali metal?
a. Rb b. Sr c. Sn d. I

71) Which of the following would require the most energy in order to remove one electron?
a. Rb b. Sr c. Sn d. I

72) Which of the following is the most active metal?
a. Rb b. Sr c. Sn d. I

73) Which alkali metal has the largest radius?
a. Li b. Na c. K d. Rb e. Cs

74) Which alkali metal is most likely to lose an electron? In other words, which one is the most active?
a. Li b. Na c. K d. Rb e. Cs

75) Which of the following is a metalloid?
a. Au b. Cu c. S d. Ge e. Kr

76) In nature, which of the following always tend to lose electrons?
a. metals b. nonmetals c. metalloids

77) The periodic table is (without exception) arranged according to:
a. atomic number b. atomic mass c. neutrons d. none of these

78) Elements which are in the same _____ tend to have the same properties
a. period b. group

79) Brittle substances which are good insulators and poor conductors are:
a. metals b. nonmetals c. metalloids

80) A transition metal which is used in tennis racquets, and has an electron arrangement ending in d^2.
a. Ca b. Ti c. Cu d. Zn

81) A transition metal used thermometers. It has an electron arrangement ending in d^{10}.
a. W b. Pt c. Os d. Hg

82) This gas is very popular in light bulbs on the Vegas Strip. Its electron configuration ends p^6.
a. N b. O c. F d. Ne

83) In its ionic form, this halogen is commonly used to prevent tooth decay.
a. Na b. Mg c. Au d. F

84) Why does atomic radius decrease as you move across a period of the periodic table from one element to the next?
a) because the increasing number of protons and decreasing number of electrons creates an attractive force which causes the atom to expand
b) because the increasing number of protons and increasing number of electrons creates an attractive force which causes the atom to shrink in on itself
c) because the decreasing number of protons and decreasing number of electrons creates an attractive force which causes the atom to shrink in on itself
d) because the decreasing number of protons and increasing number of electrons creates an attractive force which causes the atom to shrink in on itself

85-91 Matching

85) This element's family has 5 valence electrons.	a) Bromine (Br)
86) This element's family likes to take on the charge of -2.	b) Silicon (Si)
87) This element ends in $4s^24p^5$ and is a poisonous brown liquid.	c) Oxygen (O)
88) This element is a metalloid, and is in computer chips.	d) Copper (Cu)
89) This element is a colorless, inert gas.	e) Rubidium (Rb)
90) This metal reacts violently in water, and can be cut with a knife.	ab) Krypton (Kr)
91) Prior to 1982, this element was the primary metal in a penny. Its configuration ends $4s^13d^{10}$	ac) Phosporus (P)

ANSWERS TO TRENDS REVIEW TEST

1. e
2. b
3. c
4. ab
5. e
6. b
7. e
8. b
9. ab
10. c
11. ab
12. e
13. b
14. b
15. b
16. a
17. c
18. c
19. b
20. d
21. a
22. a
23. c
24. e
25. b
26. c
27. b
28. d
29. c
30. e
31. a
32. a
33. e
34. ab
35. a
36. ac
37. b
38. c
39. d
40. ad
41. ae
42. c
43. b
44. b
45. e
46. a
47. c
48. c
49. b
50. e
51. b
52. c
53. a
54. b
55. c
56. d
57. b
58. a
59. e
60. c
61. d
62. b
63. a
64. e
65. a
66. d
67. b
68. a
69. d
70. a
71. d
72. a
73. e
74. e
75. d
76. a
77. a
78. b
79. b
80. b
81. d
82. d
83. d
84. b
85. ac
86. c
87. a
88. b
89. ab
90. e
91. d